

REMARKS/ARGUMENTS

Claims 1-11 are pending. Claims 1, 3, 5, and 6 have been amended. New claims 7-11 have been added. No new matter has been introduced. Applicants believe the claims comply with 35 U.S.C. § 112.

Claims 1-6 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Yamashita et al. (US 6,507,446 B2).

Claims 1, 2, and 7-9

Applicants respectfully submit that independent claim 1 as amended is novel and patentable over Yamashita et al. because, for instance, Yamashita et al. does not teach or suggest a substrate provided with a groove that is being formed in a surface thereof to extend from a first end of the substrate toward a second end of the substrate opposite from the first end of the substrate but not to extend to the second end of the substrate. Nor does it disclose or suggest that an adhesive is applied to a portion of at least the second slope surface but not to the first slope surface of the groove at all, and that the lens is adhered to the portion of at least the second slope surface by the adhesive while the lens is not adhered to the first slope surface at all.

As discussed in the present application at page 15, line 10 to page 19, line 4, the recited features are provided to address the problems of positional misalignment or detachment 124 of the lens 2 due to a difference in thermal expansion coefficient between the lens 2 and the silicon substrate 1. The conventional structure adhering the lens to both the first slope surface 41 and the second slope surface 42 seems to secure the lens in the groove; however, the inventors found that such a structure produces the problems of positional misalignment or detachment as illustrated in Fig. 7C. In claim 1, the adhesive is not applied to the first slope surface of the groove at all, and the lens is not adhered to the first slope surface at all.

In contrast, Yamashita et al. discloses that the lateral V-shaped groove 2 and the longitudinal V-shaped groove 3 are formed on one surface 1a of the substrate 1 so that both the V-shaped grooves cross each other, and the spherical lens 100 is arranged so that the

surface of the spherical lens 100 can be in contact with the four ridges 41, 42, 43, 44, as illustrated in Fig. 1(b) and described at column 5, lines 15-24. As discussed at column 10, lines 56-65, the adhesion means 5 is used as an adhesive or glass solder to fix the spherical lens 100 on the glass substrate 1 in Fig. 9(a).

Yamashita et al. fails to teach adhering the spherical lens 100 to one slope surface of the V-shaped groove but not to the other slope surface opposite to the one slope surface of the V-shaped groove. Moreover, assuming that the first slope surface and the second slope surface in claim 1 includes a pair of the ridges (41 and 43, or 42 and 44), opposite to each other, Yamashita et al. fails to disclose adhering the spherical lens 100 to one of the pair of the ridges but not to the other ridge. In addition, Yamashita et al. does not mention or address the problem of positional misalignment or detachment of the spherical lens with respect to the glass substrate 1.

For at least the foregoing reasons, independent claim 1 and claims 2 and 7-9 depending therefrom, are novel and patentable over Yamashita et al.

Claims 3 and 4

Applicants respectfully assert that independent claim 3 as amended is novel and patentable over Yamashita et al. because, for instance, Yamashita et al. does not teach or suggest an adhesive is applied to a portion of at least the second slope surface but not to the first slope surface of the groove so as to adhere a side surface of the cylinder-shaped lens to the portion of at least the second slope surface in the groove in a structure in which the side surface of the cylinder-shaped lens is in contact with or in the proximity of the first slope surface and the second slope surface, and that a side of the cylinder-shaped lens is adhered to the portion of at least the second slope surface by the adhesive while the cylinder-shaped lens is not adhered to the first slope surface at all.

As discussed above, Yamashita et al. discloses that the spherical lens 100 is arranged so that the surface of the spherical lens 100 can be in contact with the four ridges 41, 42, 43, 44 in Fig. 1(b), and that the adhesion means 5 is used as an adhesive or glass solder to fix the spherical lens 100 on the glass substrate 1 in Fig. 9(a). Yamashita et al. fails to teach adhering the spherical lens 100 to one slope surface of the V-shaped groove but not

to the other slope surface opposite to the one slope surface of the V-shaped groove. Moreover, assuming that the first slope surface and the second slope surface in claim 1 includes a pair of the ridges (41 and 43, or 42 and 44), opposite to each other, Yamashita et al. fails to disclose adhering the spherical lens 100 to one of the pair of the ridges but not to the other ridge. Yamashita et al. simply does not address the problem of positional misalignment or detachment of the spherical lens with respect to the glass substrate 1.

For at least the foregoing reasons, independent claim 3 and claim 4 depending therefrom are novel and patentable over Yamashita et al.

Claims 5 and 10

Applicants respectfully contend that independent claim 5 as amended is novel and patentable over Yamashita et al. because, for instance, Yamashita et al. fails to teach or suggest a lens putting step of applying an adhesive to a portion of at least the second slope surface but not to the first slope surface of the groove formed in the groove forming step and putting the lens in the groove in such a manner as to be in contact with or in the proximity of the first slope surface and the second slope surface while any other adhesive is applied to the first slope surface.

As discussed above, Yamashita et al. discloses that the spherical lens 100 is arranged so that the surface of the spherical lens 100 can be in contact with the four ridges 41, 42, 43, 44 in Fig. 1(b), and that the adhesion means 5 is used as an adhesive or glass solder to fix the spherical lens 100 on the glass substrate 1 in Fig. 9(a). Yamashita et al. fails to teach adhering the spherical lens 100 to one slope surface of the V-shaped groove but not to the other slope surface opposite to the one slope surface of the V-shaped groove. Yamashita et al. simply does not address the problem of positional misalignment or detachment of the spherical lens with respect to the glass substrate 1.

For at least the foregoing reasons, independent claim 5 and claim 10 depending therefrom are novel and patentable over Yamashita et al.

Claims 6 and 11

Applicants respectfully submit that independent claim 6 as amended is novel and patentable over Yamashita et al. because, for instance, Yamashita et al. does not disclose

or suggest a cylinder-shaped lens mounting step of applying an adhesive to a portion of at least the second slope surface but not to the first slope surface of the groove formed in the groove forming step and putting the cylinder-shaped lens in the groove in such a manner as to be in contact with or in the proximity of the first slope surface and the second slope surface under the condition that any other adhesive is applied to the first slope surface.

As discussed above, Yamashita et al. discloses that the spherical lens 100 is arranged so that the surface of the spherical lens 100 can be in contact with the four ridges 41, 42, 43, 44 in Fig. 1(b), and that the adhesion means 5 is used as an adhesive or glass solder to fix the spherical lens 100 on the glass substrate 1 in Fig. 9(a). Yamashita et al. fails to teach adhering the spherical lens 100 to one slope surface of the V-shaped groove but not to the other slope surface opposite to the one slope surface of the V-shaped groove. Yamashita et al. simply does not address the problem of positional misalignment or detachment of the spherical lens with respect to the glass substrate 1.

For at least the foregoing reasons, independent claim 6 and claim 11 depending therefrom are novel and patentable over Yamashita et al.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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